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(54) IMPROVEMENTS IN LIGHTERS, HAVING A FLINT AND
 KNURLED WHEEL, FOR BURNERS

(71) We, "APPLICATION DES GAZ", a French Joint Stock Company of 15 rue Chateaubriand, Paris (Seine, France), do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to lighters for gas burners.

A known form of lighter comprises a knurled wheel which may be driven to rotate by means of a knob or the like, and a flint biased to engage the wheel. The disadvantage of known arrangements of this kind are that if it is desired to effect lighting with a minimum of risk of failure, the knurled wheel and the flint must be extremely close to the burner so that, when the burner is fully alight, these two elements and the members associated with them are heated to an excessive temperature, the result of which is rapid deterioration.

This disadvantage is overcome by a lighter in accordance with the invention which comprises a knurled wheel and flint carrying means for mounting a flint in engagement therewith, the knurled wheel being fixedly mounted at one end of a first rotatable shaft at the other end of which a first gear is fixedly mounted, the first shaft being mounted for pivotal movement about a second rotatable shaft, transverse to the first shaft, on which is fixedly mounted a second gear engaged with the first gear.

When the second shaft is rotated, since the flint applies a considerable braking torque to the knurled wheel, the first shaft is caused to pivot from an inoperative position, to an operative position close to the burner, whereupon, on rotation of the first shaft being arrested the knurled wheel is rotated so as to produce sparks from the flint. Once lighting has been effected, the first shaft is returned to the inoperative position, such return optionally being effected under the influence of gravity or for

example with the aid of an appropriate return spring.

One embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:—

Figure 1 is an elevational view, in section, of a gas lamp having an incandescent mantle and involving application of a lighting device according to the invention, the elements being shown in the operative position;

Figure 2 is an exploded view of the said device;

Figure 3 is a plan view drawn to a small scale of the base plate of the lamp of Figure 1; and

Figure 4 is a perspective view of a portion of the said base plate, the members or elements being shown in the inoperative position. In this Figure, the section plane of Figure 1 has been indicated at I—I.

The lamp itself comprises a lower support or leg 1 of bell-shape which contains a cartridge of liquefied gas under pressure. A head 2 screwed on the support 1 permits extraction of the gas from the cartridge by means of a perforator device of known type, for the supply thereof to a burner 3, the flow of the gas being controlled by a tap 4. The burner 3 is capped by an incandescent mantle 5 and the entire arrangement is surrounded by a cylindrical glass 6 bearing on a circular base plate 7 secured to the head 2.

A yoke 8 (Figure 2) is secured to the base plate 7 by a rivet 9 (Figure 1) extending into an aperture 8a (Figure 2) formed in the yoke, and is prevented from rotating by means of dogs 8b projecting from the upper face of the yoke which engage in associated apertures in the plate. The arrangement is such that the transverse axis A—A of the yoke, i.e. the axis of symmetry thereof perpendicular to the axis determined by the perforations in its limbs, extends at a distance *a* (Figure 3) from the centre of the plate 7, for reasons which will be discussed

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later. The yoke 8 receives a rotatable drive shaft 10 of which a portion 10a of larger diameter extends forwardly as seen in Figure 1. The portion 10a has a double flat 10b over a small length adjacent the portion of smaller diameter. The portion 10a terminates in a manipulating knob 11 (see also Figure 4). The double flat 10b, which is normally situated between the limbs of the fork 8, receives as a force fit a crown wheel 12 which is formed with a corresponding central slot 12a and teeth 12b.

Mounted for rotation on the shaft 10 is a stirrup member 13 on which is fixedly mounted a tubular support 14. The two limbs of the stirrup member is positioned between those of the yoke 8 and the crown wheel 12 is mounted on the double flat 10b within the stirrup. The free end of the shaft 10 is burred, to prevent withdrawal from the yoke 8.

The teeth 12b of the crown wheel 12 mesh with a pinion 15 carried on one end of a shaft 16 which is mounted for rotation within the tubular support 14. The other end of the shaft is screwthreaded, as indicated at 16a, and it projects beyond the support 14 to receive a conventional circular knurled wheel 17. The end of the support opposite the stirrup member 13 is provided with a lateral lug 18 supporting a sleeve 19 perpendicular to the shaft 16. Mounted slidably in the sleeve is a flint 20 which is biased into engagement with the knurled wheel 17, by a compression spring 21 the outer end of which bears in against the bottom of a cap 22 screwed on the sleeve 19 which is appropriately formed with an external screwthread.

The base plate 7 of the lamp is formed with an elongate window 7a (Figures 1, 3 and 4) arranged along the aforesaid transverse axis A—A of the yoke 8, in such manner that the support 14 can pivot about the shaft 10 passing through the window to the position shown in Figure 7. The width of the window is of course greater than that of the support, but it is less than the diameter of the knurled wheel 17 which is thus not able to pass through it. However, at its end located in the immediate vicinity of the yoke 8, the said window 7 widens out suddenly as indicated at 7b in Figures 3 and 4, to permit the passage of the transverse limb of the stirrup member 13. The transverse edge 7c at the end of the widened portion 7b is disposed in such a position relative to the yoke 8 that it constitutes an abutment for the limbs of the stirrup member 13, thus limiting the pivotal movement of the support 14 about the shaft 10, to an oblique position (shown in Figure 1) wherein the point of contact between the flint 20 and the knurled wheel 17 is located substantially in

a radial plane relative to the burner and parallel to the shaft 10. The length of the support 15 is such that the aforesaid contact point is substantially at the level of the sleeve 5. Finally, the distance *a* (Figure 3) is selected to be such that the knurled wheel does not contact the sleeve and there is therefore no risk of deterioration thereof.

The mode of functioning is as follows:

In the inoperative state, the oscillating support tends to drop back under force of gravity, pivoting about the shaft 10. Such displacement is arrested by the knurled wheel 17 which bears on the edges of the window 7a through which it is not able to travel. The position then is that shown in Figure 4.

In order to light the lamp, after having opened the tap 4, the knob 11 is manipulated. Due to the braking effect exerted by the flint 20 on the knurled wheel 17, the shaft 16 does not initially rotate, so that the sole effect of the torque exerted on the knob is to rotate the support about the shaft 10 in the ascending direction. In this way, the position shown in Figure 1 is reached wherein the limbs of the stirrup member 13 abut against the terminal edge 7c of the widened portion 7b of the window 7a. From this instant on, the support 14 is no longer able to rotate and consequently the torque applied to the knob rotates the knurled wheel 17 through the agency of the gears 12, 15 and the shaft 16, thus producing sparks in the conventional manner. The said sparks are projected in the direction of the sleeve 5, which is extremely close, and they thus light the gas with maximum efficacy.

As soon as lighting has been effected, the knob 11 is released, so that the oscillating support drops back and the entire assembly of the device returns into the inoperative position shown in Figure 4, wherein the knurled wheel, the flint and all the members or elements associated therewith are located well below the sleeve 5, so that there is no risk whatsoever of their being brought to an excessive temperature.

Thus, the invention has in fact permitted the provision of a lighter device wherein the flint and the knurled wheel are disposed in the immediate vicinity of the outlet of the burner to be ignited during the lighting operation, whilst at the same time being spaced well away under normal functioning conditions, all this with an extremely simple mode of construction and without requiring any kind of accessory manipulation from the operator apart from the rotation of the knob 11.

It will be appreciated that the device according to the invention may be applied to any type of apparatus having a gas burner, whatever the nature of the said gas burner apparatus and/or the shape of the burner.

WHAT WE CLAIM IS:—

1. A lighter for a gas burner comprising a knurled wheel and flint carrying means for mounting a flint in engagement therewith, the knurled wheel being fixedly mounted at one end of a first rotatable shaft at the other end of which a first gear is fixedly mounted, the first shaft being mounted for pivotal movement about a second rotatable shaft, transverse to the first shaft, on which is fixedly mounted a second gear engaged with the first gear.
2. A lighter for a gas burner as claimed in Claim 1 wherein the first rotatable shaft is mounted in a tubular support member carried by a stirrup member pivotally mounted on the second rotatable shaft on opposite sides of the two gears.
3. A lighter for a gas burner substantially as hereinbefore described with reference to the accompanying drawings.
4. A gas appliance having a lighter as claimed in any preceding claim, a stop member being included to limit pivotal movement of the first shaft towards the burner at a position wherein the flint carrying means and knurled wheel are suitably positioned to ignite the burner.
5. A gas appliance as claimed in Claim 4 wherein a further stop is provided to limit pivotal movement of the first shaft away from the burner at a cool position remote from the burner.
6. A gas appliance as claimed in Claim 4 or 5 wherein the second shaft is mounted under a base plate provided below the burner the first shaft extending through a window formed in the said plate and of a width such that the knurled wheel is not able to pass through it, an edge of the window constituting the stop limiting the pivotal movement towards the burner.
7. A gas appliance having a lighter substantially as hereinbefore described with reference to the accompanying drawings.

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